WHAT IS CLAIMED IS:

1.   A system for generating a vendor-independent Web Service architecture, comprising:

a processor; and

a memory comprising program instructions, wherein the program instructions are executable by the processor to:

identify one or more logical components of the Web Service architecture according to one or more use case requirements for a Web Service;

translate the one or more use case requirements and one or more technical constraints to determine a plurality of heterogeneous Web Service components;

categorize the Web Service components according to a Web Service architecture framework;

organize the Web Service components according to two or more tiers and two or more layers of the Web Service architecture;

modify one or more software components according to one or more architecture principles for each of the one or more tiers and the one or more layers; and

apply one or more Web Services design patterns to the Web Service architecture where appropriate.

2.   The system as recited in claim 1, wherein the Web Service architecture is configured for use in implementing a Web Service.

3.   The system as recited in claim 2, wherein the Web Service comprises:

a service provider configured to provide one or more services of the Web Service; and

one or more service requesters configured to access the one or more services from the service provider via a network.

4.   The system as recited in claim 3, wherein the Web Service further comprises a service broker configured to interact with the service provider and service requester to negotiate and provide the services of the service provider to the service requester.

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5.   The system as recited in claim 3, wherein the Web Service further comprises a service registry, wherein the service provider is further configured to register and publish the services in the service registry, and wherein the service requester is further configured to discover the service provider through the service registry.

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6.   The system as recited in claim 2, wherein the Web Service is a Business-to-Consumer Web Service, wherein the service provider is a business service provider, and wherein the service requester is an end user.

15   7.   The system as recited in claim 2, wherein the Web Service is a Business-to-Business Web Service, wherein the service provider is a business service provider, and wherein the service requester is a server.

8.   The system as recited in claim 1, wherein, to categorize the Web Service
20   components according to a Web Service architecture framework, the program instructions are further executable by the processor to categorize the Web Service components into one or more of service delivery, service management, identity/policy and services Web Service components.

25   9.   The system as recited in claim 1, wherein the layers comprise two or more of:
       a network layer configured to serve as an underlying network for Web Services
            implemented according to the Web Service architecture;
       a transport layer for delivering messages between components of the Web
            Services;
30   a service description language layer configured to describe service type and

functionality of the Web Services;

a transaction routing layer configured to route messages on the transport layer;

a service discovery layer configured to search for and locate the Web Services;

a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the Web Service architecture;

a management layer configured for provisioning of the Web Services and for monitoring and administration of the Web Services;

a Quality of Service layer configured to provide reliability, scalability, and availability for the Web Services;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

10.   The system as recited in claim 1, wherein the design patterns comprise one or more of:

one or more Quality of Services design patterns; and

one or more Security design patterns.

11.   The system as recited in claim 1, wherein the memory further comprises a Web Services Design Pattern catalog, wherein the program instructions are further executable by the processor to access the one or more Web Services design patterns from the Web Services Design Pattern catalog for said application to the Web Service architecture.

12.   The system as recited in claim 11, wherein the Web Services Design Pattern catalog is configured for use in generating one or more additional Web Service architectures.

13.   The system as recited in claim 11, wherein the program instructions are further executable by the processor to:

determine one or more new Web Services design patterns for application to the Web Service architecture; and

record the one or more new Web Services design patterns in the Web Services Design Pattern catalog.

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14.   The system as recited in claim 11, wherein the program instructions are further executable by the processor to:

determine that one of the one or more Web Services design patterns in the Web Services Design Pattern catalog need to be modified for the Web Service

10   architecture; and

modify the Web Services design pattern in the Web Services Design Pattern catalog.

15.   The system as recited in claim 1, wherein the Web Service architecture is

15   configured for use in implementing an Enterprise integrated Web Service.

16.   The system as recited in claim 1, wherein the Web Service architecture is configured for use in implementing a Cross-Enterprise integrated Web Service.

20   17.   The system as recited in claim 1, wherein the Web Service architecture framework comprises an enterprise and cross-enterprise integration framework, and wherein the Web Service architecture is configured for use in implementing an Enterprise or a Cross-Enterprise integrated Web Service.

25   18.   The system as recited in claim 17, wherein the program instructions are further executable by the processor to:

define a plurality of integration tiers, one or more basic components, and one or more Web Services technologies for enterprise or cross-enterprise integration according to the enterprise and cross-enterprise integration

30   framework; and

define how each of the plurality of integration tiers communicates with others of the plurality of integration tiers according to the enterprise and cross-enterprise integration framework.

19.   The system as recited in claim 18, wherein the program instructions are further executable by the processor to define integration of one or more EAI products with the one or more Web Services technologies according to the enterprise and cross-enterprise integration framework.

20.   The system as recited in claim 18, wherein the plurality of integration tiers comprises one or more of: a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

21.   The system as recited in claim 17, wherein the enterprise and cross-enterprise integration framework comprises one or more integration design patterns configured for use in generating the Web Service architecture.

22.   The system as recited in claim 21, wherein the integration design patterns comprise one or more of:

an Application-to-Application Design Pattern;

a Standard Build Design Pattern;

a Hub-Spoke Replication Design Pattern;

a Federated Replication Design Pattern;

a Multi-Step Application Integration Design Pattern;

a Data Exchange Design Pattern;

a Closed Process Integration Design Pattern;

an Open Process Integration Design Pattern;

a Service Consolidation–Broker Integration design pattern; and

a Reverse Auction–Broker Integration design pattern.

23. The system as recited in claim 1, wherein the program instructions are further executable by the processor to provide integration and interoperability with the Web Service architecture for existing business functionality including one or more mainframe systems.

24. The system as recited in claim 23, wherein the one or more Web Services design patterns include one or more Mainframe Integration and Interoperability design patterns.

25. The system as recited in claim 24, wherein the Mainframe Integration and Interoperability design patterns comprise one or more of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

26. A system for designing and implementing Web Services comprising a plurality of heterogeneous components, comprising:

    means for applying a Web Services structured methodology and one or more design patterns to a Web Service architecture; and

    means for implementing a Web Service according to the Web Service architecture.

27. The system as recited in claim 26, wherein said Web Services structured methodology comprises:

    means for identifying one or more logical components of the Web Service architecture according to one or more use case requirements for a Web Service;

    means for translating the one or more use case requirements and one or more technical constraints to determine a plurality of heterogeneous Web Service components;

    means for categorizing the Web Service components according to a Web Service architecture framework;

means for organizing the Web Service components according to two or more tiers and two or more layers of the Web Service architecture;

means for modifying one or more software components according to one or more architecture principles for each of the one or more tiers and the one or more layers; and

means for applying one or more Web Services design patterns to the Web Service architecture where appropriate.

28. The system as recited in claim 26, wherein said Web Services structured methodology comprises means for providing integration and interoperability with the Web Service architecture for existing business functionality including one or more mainframe systems.

29. The system as recited in claim 26, wherein said Web Services structured methodology comprises means for storing and accessing the design patterns.

30. The system as recited in claim 26, wherein the Web Service architecture framework comprises an enterprise and cross-enterprise integration framework, and wherein the Web Service architecture is configured for use in implementing an Enterprise or a Cross-Enterprise integrated Web Service.

31. A method for designing and implementing a vendor-independent Web Service architecture, comprising:

identifying one or more logical components of the Web Service architecture according to one or more use case requirements for a Web Service;

translating the one or more use case requirements and one or more technical constraints to determine a plurality of heterogeneous Web Service components;

categorizing the Web Service components according to a Web Service architecture framework;

organizing the Web Service components according to two or more tiers and two or more layers of the Web Service architecture;

5   modifying one or more software components according to one or more architecture principles for each of the one or more tiers and the one or more layers; and

applying one or more Web Services design patterns to the Web Service architecture where appropriate.

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32.   The method as recited in claim 31, further comprising implementing a Web Service according to the Web Service architecture.

33.   The method as recited in claim 32, wherein the Web Service comprises a service

15   provider and a service requester, the method further comprising:

the service provider providing one or more services of the Web Service on a network; and

the service requester accessing the one or more services of the Web Service on the service provider via the network.

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34.   The method as recited in claim 33, wherein the Web Service is a Business-to-Consumer Web Service, wherein the service provider is a business service provider, and wherein the service requester is an end user.

25 35.   The method as recited in claim 33, wherein the Web Service is a Business-to-Business Web Service, wherein the service provider is a business service provider, and wherein the service requester is a server.

36.   The method as recited in claim 31, wherein said categorizing the Web Service

30   components according to a Web Service architecture framework comprises categorizing

the Web Service components into one or more of service delivery, service management, identity/policy and services Web Service components.

37.   The method as recited in claim 31, wherein the layers comprise two or more of:

a network layer configured to serve as an underlying network for Web Services implemented according to the Web Service architecture;

a transport layer for delivering messages between components of the Web Services;

a service description language layer configured to describe service type and functionality of the Web Services;

a transaction routing layer configured to route messages on the transport layer;

a service discovery layer configured to search for and locate the Web Services;

a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the Web Service architecture;

a management layer configured for provisioning of the Web Services and for monitoring and administration of the Web Services;

a Quality of Service layer configured to provide reliability, scalability, and availability for the Web Services;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

38.   The method as recited in claim 31, wherein the design patterns comprise one or more of:

one or more Quality of Services design patterns; and

one or more Security design patterns.

39.   The method as recited in claim 31, wherein said applying one or more Web Services design patterns to the Web Service architecture comprises accessing the one or more Web Services design patterns from a Web Services Design Pattern catalog.

5   40.   The method as recited in claim 39, wherein the Web Services Design Pattern catalog is configured for use in generating one or more additional Web Service architectures.

41.   The method as recited in claim 31, wherein the one or more Web Services design
10   patterns are accessed from a Web Services Design Pattern catalog, the method further comprising:

        determining one or more new Web Services design patterns for application to the
                Web Service architecture; and
        recording the one or more new Web Services design patterns in the Web Services
15   Design Pattern catalog.

42.   The method as recited in claim 31, further comprising implementing an Enterprise integrated Web Service according to the Web Service architecture.

20   43.   The method as recited in claim 31, further comprising implementing a Cross-Enterprise integrated Web Service according to the Web Service architecture.

44.   The method as recited in claim 31, wherein the Web Service architecture framework comprises an enterprise and cross-enterprise integration framework, and
25   wherein the Web Service architecture is configured for use in implementing an Enterprise or a Cross-Enterprise integrated Web Service.

45.   The method as recited in claim 44, further comprising:
        defining a plurality of integration tiers, one or more basic components, and one or
30   more Web Services technologies for enterprise or cross-enterprise

integration according to the enterprise and cross-enterprise integration framework; and

defining how each of the plurality of integration tiers communicates with others of the plurality of integration tiers according to the enterprise and cross-enterprise integration framework.

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46.   The method as recited in claim 45, further comprising defining integration of one or more EAI products with the one or more Web Services technologies according to the enterprise and cross-enterprise integration framework.

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47.   The method as recited in claim 45, wherein the plurality of integration tiers comprises one or more of: a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

15   48.   The method as recited in claim 45, wherein the enterprise and cross-enterprise integration framework comprises one or more integration design patterns configured for use in generating the Web Service architecture.

49.   The method as recited in claim 48, wherein the integration design patterns

20   comprise one or more of:

an Application-to-Application Design Pattern;

a Standard Build Design Pattern;

a Hub-Spoke Replication Design Pattern;

a Federated Replication Design Pattern;

25   a Multi-Step Application Integration Design Pattern;

a Data Exchange Design Pattern;

a Closed Process Integration Design Pattern;

an Open Process Integration Design Pattern;

a Service Consolidation–Broker Integration design pattern; and

30   a Reverse Auction–Broker Integration design pattern.

50.   The method as recited in claim 31, further comprising providing integration and interoperability with the Web Service architecture for existing business functionality including one or more mainframe systems.

51.   The method as recited in claim 50, wherein the one or more Web Services design patterns include one or more Mainframe Integration and Interoperability design patterns.

52.   The method as recited in claim 51, wherein the Mainframe Integration and Interoperability design patterns comprise one or more of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

53.   A computer-accessible medium comprising program instructions, wherein the program instructions are configured to implement:

    identifying one or more logical components of the Web Service architecture according to one or more use case requirements for a Web Service;

    translating the one or more use case requirements and one or more technical constraints to determine a plurality of heterogeneous Web Service components;

    categorizing the Web Service components according to a Web Service architecture framework;

    organizing the Web Service components according to two or more tiers and two or more layers of the Web Service architecture;

    modifying one or more software components according to one or more architecture principles for each of the one or more tiers and the one or more layers; and

    applying one or more Web Services design patterns to the Web Service architecture where appropriate.

54.   The computer-accessible medium as recited in claim 53, wherein the Web Service architecture is configured for use in implementing a Web Service.

55.   The computer-accessible medium as recited in claim 54, wherein the Web Service comprises:

        a service provider configured to provide one or more services of the Web Service on a network; and

        a service requester configured to access the one or more services of the Web Service on the service provider via the network.

56.   The computer-accessible medium as recited in claim 55, wherein the Web Service is a Business-to-Consumer Web Service, wherein the service provider is a business service provider, and wherein the service requester is an end user.

57.   The computer-accessible medium as recited in claim 55, wherein the Web Service is a Business-to-Business Web Service, wherein the service provider is a business service provider, and wherein the service requester is a server.

58.   The computer-accessible medium as recited in claim 53, wherein, in said categorizing the Web Service components according to a Web Service architecture framework, the program instructions are further configured to implement categorizing the Web Service components into one or more of service delivery, service management, identity/policy and services Web Service components.

59.   The computer-accessible medium as recited in claim 53, wherein the layers comprise two or more of:

        a network layer configured to serve as an underlying network for Web Services implemented according to the Web Service architecture;

        a transport layer for delivering messages between components of the Web Services;

a service description language layer configured to describe service type and functionality of the Web Services;

a transaction routing layer configured to route messages on the transport layer;

a service discovery layer configured to search for and locate the Web Services;

a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the Web Service architecture;

a management layer configured for provisioning of the Web Services and for monitoring and administration of the Web Services;

a Quality of Service layer configured to provide reliability, scalability, and availability for the Web Services;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

60.   The computer-accessible medium as recited in claim 53, wherein the design patterns comprise one or more of:

one or more Quality of Services design patterns; and

one or more Security design patterns.

61.   The computer-accessible medium as recited in claim 53, wherein, in said applying one or more Web Services design patterns to the Web Service architecture, the program instructions are further configured to implement accessing the one or more Web Services design patterns from a Web Services Design Pattern catalog.

62.   The computer-accessible medium as recited in claim 61, wherein the Web Services Design Pattern catalog is configured for use in generating one or more additional Web Service architectures.

63. The computer-accessible medium as recited in claim 61, wherein the program instructions are further configured to implement:

determining one or more new Web Services design patterns for application to the Web Service architecture; and

recording the one or more new Web Services design patterns in the Web Services Design Pattern catalog.

64. The computer-accessible medium as recited in claim 53, wherein the Web Service architecture is configured for use in implementing an Enterprise integrated Web Service according to the Web Service architecture.

65. The computer-accessible medium as recited in claim 53, wherein the Web Service architecture is configured for use in implementing a Cross-Enterprise integrated Web Service.

66. The computer-accessible medium as recited in claim 53, wherein the Web Service architecture framework comprises an enterprise and cross-enterprise integration framework, and wherein the Web Service architecture is configured for use in implementing an Enterprise or a Cross-Enterprise integrated Web Service.

67. The computer-accessible medium as recited in claim 66, wherein the program instructions are further configured to implement:

defining a plurality of integration tiers, one or more basic components, and one or more Web Services technologies for enterprise or cross-enterprise integration according to the enterprise and cross-enterprise integration framework; and

defining how each of the plurality of integration tiers communicates with others of the plurality of integration tiers according to the enterprise and cross-enterprise integration framework.

68.   The computer-accessible medium as recited in claim 67, wherein the program instructions are further configured to implement defining integration of one or more EAI products with the one or more Web Services technologies according to the enterprise and cross-enterprise integration framework.

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69.   The computer-accessible medium as recited in claim 67, wherein the plurality of integration tiers comprises one or more of: a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

10   70.   The computer-accessible medium as recited in claim 67, wherein the enterprise and cross-enterprise integration framework comprises one or more integration design patterns configured for use in generating the Web Service architecture.

71.   The computer-accessible medium as recited in claim 70, wherein the integration
15   design patterns comprise one or more of:

        an Application-to-Application Design Pattern;

        a Standard Build Design Pattern;

        a Hub-Spoke Replication Design Pattern;

        a Federated Replication Design Pattern;

20   a Multi-Step Application Integration Design Pattern;

        a Data Exchange Design Pattern;

        a Closed Process Integration Design Pattern;

        an Open Process Integration Design Pattern;

        a Service Consolidation–Broker Integration design pattern; and

25   a Reverse Auction–Broker Integration design pattern.

72.   The computer-accessible medium as recited in claim 53, wherein the program instructions are further configured to implement providing integration and interoperability with the Web Service architecture for existing business functionality including one or
30   more mainframe systems.

73.   The computer-accessible medium as recited in claim 72, wherein the one or more Web Services design patterns include one or more Mainframe Integration and Interoperability design patterns.

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74.   The computer-accessible medium as recited in claim 73, wherein the Mainframe Integration and Interoperability design patterns comprise one or more of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

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